

CLAIMS

We claim:

1. An electrical coil-based device based on at least some nano-scale structures, comprising:
 - At least one magnetically-soft core;
 - At least one coil made of an electrically insulated electrically conducting wire, wrapped around at least part of said core.
2. The device of claim 1 wherein said core contains nano-size structures within the substrate of the core.
3. The device of claim 2 wherein said nano-size structures are Bucky balls with impurities that make them magnetically responsive.
4. The device of claim 3 wherein said Bucky balls have impurities that make them less conducting electrically.
5. The device of claim 2 wherein said nano-size structures are Bucky tubes with impurities that make them magnetically responsive.
6. The device of claim 5 wherein said Bucky tubes are of types that are bad electrical conductors.
7. The device of claim 5 wherein said Bucky tubes have impurities that make them less conducting electrically.
8. The device of claim 6 wherein said Bucky tubes have impurities that make them less conducting electrically.
9. The device of claim 2 wherein said nano-size structures are a combination of Bucky balls and Bucky tubes.
10. The device of claim 1 wherein said electrical wires are based on Bucky tubes.

11. The device of claim 2 wherein said electrical wires are based on Bucky tubes.
12. A method of making electrical coil-based devices based on at least some nano-scale structures, comprising:
 - Providing at least one magnetically-soft core;
 - Providing at least one coil made of an electrically insulated electrically conducting wire, wrapped around at least part of said core.
13. The method of claim 12 wherein said core contains nano-size structures within the substrate of the core.
14. The method of claim 13 wherein said nano-size structures are Bucky balls with impurities that make them magnetically responsive.
15. The method of claim 14 wherein said Bucky balls have impurities that make them less conducting electrically.
16. The method of claim 13 wherein said nano-size structures are Bucky tubes with impurities that make them magnetically responsive.
17. The method of claim 16 wherein said Bucky tubes are of types that are bad electrical conductors.
18. The method of claim 16 wherein said Bucky tubes have impurities that make them less conducting electrically.
19. The method of claim 17 wherein said Bucky tubes have impurities that make them less conducting electrically.
20. The method of claim 13 wherein said nano-size structures are a combination of Bucky balls and Bucky tubes.
21. The method of claim 1 wherein said electrical wires are based on Bucky tubes.
22. The method of claim 1 wherein said electrical wires are based on Bucky tubes.

23. The method of claim 21 wherein said electrical wires are constructed from smaller bucky tubes by using an electromagnetic field in order to control their orientation and positioning.
24. The method of claim 21 wherein said electrical wires are constructed from smaller bucky tubes by using an electrostatic field in order to control their orientation and positioning.
25. The method of claim 21 wherein said electrical wires are constructed from smaller bucky tubes by using a holographic wave guide in order to control their orientation and positioning.
26. The method of claim 21 wherein said electrical wires are constructed from smaller bucky tubes by using a lithographically produced mask in order to control their orientation and positioning.
27. The Method of claim 25 wherein at least one of an electrostatic field and an electromagnetic field is used in order to control their orientation and positioning of the bucky tubes.
28. The Method of claim 26 wherein at least one of an electrostatic field and an electromagnetic field is used in order to control their orientation and positioning of the bucky tubes.
29. The method of claim 23 wherein said Bucky tubes are glued together by chemical means.
30. The method of claim 24 wherein said Bucky tubes are glued together by chemical means.

31. The method of claim 25 wherein said Bucky tubes are glued together by chemical means.
32. The method of claim 26 wherein said Bucky tubes are glued together by chemical means.
33. The method of claim 27 wherein said Bucky tubes are glued together by chemical means.
34. The method of claim 28 wherein said Bucky tubes are glued together by chemical means.
35. The method of claim 25 wherein said Bucky tubes are fused together by bombarding them with additional high energy carbon elements.
36. The method of claim 26 wherein said Bucky tubes are fused together by bombarding them with additional high energy carbon elements.
37. The method of claim 27 wherein said Bucky tubes are fused together by bombarding them with additional high energy carbon elements.
38. The method of claim 28 wherein said Bucky tubes are fused together by bombarding them with additional high energy carbon elements.
39. The method of claim 21 wherein said electrical wires are constructed by condensing graphite vapors into bucky tubes while using an electromagnetic field in order to control their orientation and positioning.
40. The method of claim 21 wherein said electrical wires are constructed by condensing graphite vapors into bucky tubes while using an electrostatic field in order to control their orientation and positioning.
41. The method of claim 21 wherein said electrical wires are constructed by condensing graphite vapors into bucky tubes while using a holographic wave guide in order to control their orientation and positioning.

42. The method of claim 21 wherein said electrical wires are constructed by condensing graphite vapors into bucky tubes while using a lithographically produced mask in order to control their orientation and positioning.
43. The method of claim 28 wherein high pressure is used in order to force the Bucky tubes to fuse together.
44. The method of claim 28 wherein methane gas and microwave radiation is used in order to attach additional carbon atoms to adjacent Bucky tubes.
45. A method of producing magnetic cores wherein magnetic field lines are used to better order the magnetically responsive elements within the core.